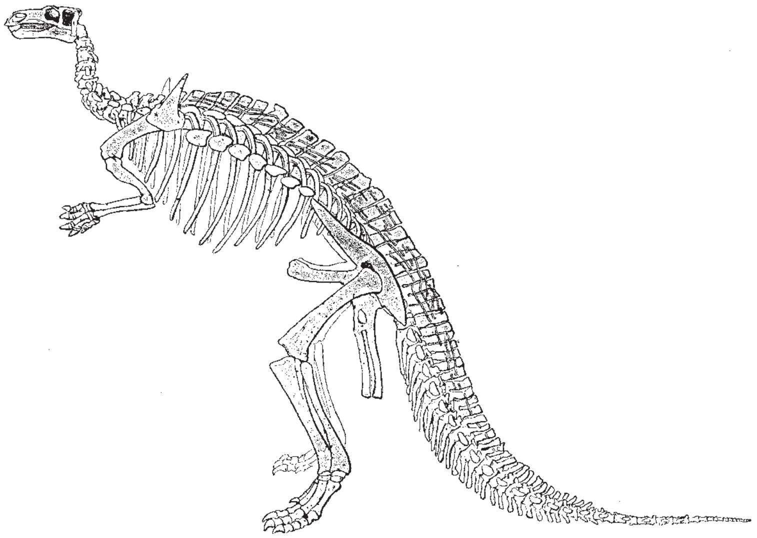
fully exhibited on both sides. It may, however, be worth the consideration of the authorities of the Museum, whether this skeleton might not be more easily understood by the uninitiated if the various bones were labelled with their scientific, and perhaps also with their popular, names, since it is somewhat puzzling, even to the expert, to name them all at a glance.

As already mentioned, the skull of the skeleton was figured by Sir R. Owen in 1861, and the acquisition of the remainder of the skeleton enabled that eminent palæontologist to confirm his reference of the skull to the genus *Scelidosaurus*. The body-skeleton formed, indeed, the subject of a second memoir published by the Palæontographical Society in 1862, with eleven quarto plates; but we venture to say that these illustrations do not render justice to the specimen, since they only include separate portions. To fully illustrate this unrivalled skeleton would, indeed, require a double quarto plate, in which the whole specimen should be shown, with the individual bones duly labelled; and a task thus remains for some zealous palæontologist to fulfil.

The accompanying figure is an attempt at a restoration of the skeleton in the natural position of the animal. The presence of a predentary bone in advance of the mandibular symphysis is based on the occurrence of this element in *Iguanodon* and the allied *Stegosaurus*; while the five digits in the hand are likewise introduced from the evidence of the latter genus.

The importance of this specimen is that it is the only English Dinosaur, with the exception of the small *Hypsilophodon*, which shows all the bones of the skeleton in position; and although it is of course exceedingly easy to be wise after the event, yet we cannot help thinking that this skeleton might have afforded its describer the opportunity of being the first to determine the true nature and position of the bones of the pelvis in this group of Dinosaurs—a problem which was solved in a paper communicated to the Geological Society in 1876. The two parallel bones lying on the inferior aspect of the hinder part of the trunk of this specimen, and directed backwardly, could not, indeed, possibly have been taken for anything else but the pubis and ischium; and the resemblance of the latter bone to the problematical "*os cuvieri*," or so-called clavicle, of Mantell's imperfect skeleton of *Iguanodon*, which has for many years been in the Museum, might have suggested the homology of the two bones. Curiously enough, however, the pubis and ischium, which are certainly the most remarkable bones in the whole skeleton, are not figured, and apparently not even mentioned, in the original memoir.



Approximate restoration of the skeleton of *Scelidosaurus harrisoni*, from the Lower Lias of Charmouth. Greatly reduced. The vertebral column has been restored from *Iguanodon*, and the spines and chevrons of the vertebræ are, not improbably, too long: the ossified tendons are conjectural.

Finally, it may perhaps interest some of our readers who do not follow the ever-changing classifications of the palæontologists, to mention that the genus *Scelidosaurus* is the type of a family referred by Prof. O. C. Marsh to his sub-order Stegosauria. Other authorities, however, consider that this sub-order is not really separable from the Ornithopoda of the same writer, which includes the Iguanodons. Accepting this emendation, the Ornithopoda will be a sub-order of Dinosauria, including all those forms in which the pelvis has a structure comparable to that of the Struthious birds; while the remaining members of that order may be classed in the sub-order Theropoda, as represented by *Megalosaurus*, and the Sauropoda, as represented by *Cetiosaurus* and *Pelorosaurus*. Recently, indeed, it has been proposed to abolish the name Dinosauria, and to group the Theropoda and Sauropoda together under the new name of Saurischia, and to apply the name Ornithischia to the Ornithopoda. The name Dinosauria has, however, become such a household word, that its suppression cannot be admitted; and if it be eventually found advisable to adopt the proposed division of these reptiles into two distinct orders, the preferable course would be to restrict the name Dinosauria to the so-called Saurischia, since *Megalosaurus* and *Cetiosaurus* were the forms first mentioned in the original notice of the order in 1840; while the earlier names, such as Ornithopoda, might be retained for the second order. In this connection we may, however, quote a remark made by an eminent man of science at a meeting of the Geological Society, to the effect that "he was inclined to think that the progress of knowledge tended rather to break down the lines of demarcation between groups supposed to be distinct, than to authorize the creation of fresh divisions." R. L.

NOTES.

We print elsewhere the Technical Instruction Bill introduced into the House of Commons last week by Sir W. Hart Dyke. The Government is to be congratulated on having presented a measure which cannot fail to produce an excellent effect on the higher branches of technical education in England.

WE regret to have to announce the death of the Rev. J. M. Berkeley, the eminent cryptogamic botanist.

THE Professorship of Civil Engineering and Mechanics in the University of Glasgow is likely to be vacant by the resignation of Prof. James Thomson, on account of weak health. The appointment, which is supposed to be worth about £600 a year, is in the gift of the Crown.

THE eleventh Congress of the Sanitary Institute, which is to meet at Worcester from September 24 to 28, will be divided into three Sections, viz. Section I. Sanitary Science and Preventive Medicine; Section II. Engineering and Architecture; Section III. Chemistry, Meteorology, and Geology. Each Section will begin its work on a separate day. A Conference of Medical Officers of Health will be held during the Congress; and there will be a Health Exhibition in the Skating Rink and special additional buildings from September 24 to October 19. This Exhibition will include sanitary apparatus and appliances, and articles for domestic use and economy.

THE International Congress on Hygiene, which is to meet in Paris on Sunday, will be attended by nearly 600 members, representing twenty-five nationalities. The Paris Correspondent of the *Times* says that the members will be lavishly entertained at the Ministry of Public Instruction, at the Ministry of the Interior, at the Hôtel de Ville, and by the town of Rheims, where they will visit the important works for the treatment of sewage. Several European Governments will be officially represented, notably Belgium, Denmark, Spain, and Turkey. Brazil and nearly all the South American Republics send official delegates. Prof. Corfield, Mr. Shirley Murphy, Dr. Alfred Carpenter, and some other Englishmen interested in sanitary questions, propose to attend the meetings.

THE International Congress of Photography will meet in Paris from August 6 to 17. The rules relating to the proceedings of the Congress have been issued.

THE eighth Congress of Russian Naturalists will be opened at St. Petersburg on January 7, 1890, and will last a week.

THE Russian Chemical and Physical Society, as we learn from its Annual Report, has now 340 members. Its Journal contains every year a most valuable index of all that is published in Russia in the domain of chemistry and chemical technology.

THE monument erected by the Russian Consul at Kashgar, in memory of Adolph Schlagintweit, is reported to be ready. It is in the form of a pyramid with an iron cross on the top, and has been erected on the very place where the great German traveller was executed by order of the then ruler of Kashgar, Vali-khan-tyuria.

ON Thursday last, the new galleries and the new greenhouse of the Museum of Natural History of Paris were formally opened by the Minister of Public Instruction, who was accompanied by the Director, Prof. Frémy, and, among others, by M. de Quatrefages, M. Gaudry, M. Chauveau, and M. E. Blanchard. The new gallery is a fine building, three stories high, built of iron and stone. The collections have already been in part transferred to it. The greenhouse is a very ordinary one. Enormous substructures have been rendered necessary by the fact that it is on the side of a small hill. The building was begun ten years ago, and serves to show what progress has since been made in the art of iron-building.

ACCORDING to the Rome Correspondent of the *Daily News*, the Municipal Council of Rome has decided to devote a sum of money to the formation of a Pasteur Institute. Confidence in M. Pasteur's treatment of hydrophobia is increasing in Italy, as is shown by the fact that little by little all the principal towns are providing buildings for the treatment of the disease by inoculation.

ADMIRAL SIR ROBERT SPENCER ROBINSON, K.C.B., F.R.S., died at his residence, 61 Eaton Place, on July 27, in his eighty-first year. He was elected a Fellow of the Royal Society in 1869. Among his works was a treatise on the steam-engine for marine purposes.

MR. W. F. H. BLANDFORD succeeds Mr. A. E. Shipley, who has resigned the post of Lecturer on Economic Entomology at the Royal Indian Engineering College, Cooper's Hill.

AT the session of the Council of University College, London, on July 6, the title of Emeritus Professor of Engineering and Mechanical Technology was conferred on Prof. A. B. W. Kennedy, F.R.S.

THE Association for the Improvement of Geometrical Teaching has begun the formation of a library of reference of mathematical text-books. This should increase the usefulness of the Association to teachers of mathematics, especially to such as live in the neighbourhood of London. The library already contains a respectable assortment of works, contributed by various authors and publishers. It is, of course, intended chiefly for works of recent date, but it contains a loan collection of older works, lent by Mr. F. Hockliffe, of Bedford, among which may be mentioned Cocker's "Arithmetic," Tacquet's "Elementa Geometriæ," and D'Chales' "Elements of Euclid." The library is at present under the charge of Mr. C. V. Coates (2 Prince's Mansions, Victoria Street), who will be glad to receive donations of books, pamphlets, &c., on behalf of the Association.

IN the Report submitted to the general meeting of the Scottish Meteorological Society on June 24, the Council state that the preparation of No. VI. of the Society's Journal has been kept steadily in progress, and is now in type, and will shortly be issued to members. In this number a fuller account is given than heretofore of the storms which strike the Scottish coasts, drawn chiefly from the very full and accurate reports of storms from the northern lighthouses. These reports of storms may justly be regarded as the fullest accounts of storms made anywhere in the world by observers who record the phenomena night and day. The Council are of opinion that it is not possible to overrate the importance of these observations of storms in their bearing on the discussion of the Ben Nevis observations and the weather of North-Western Europe, which, it is proposed, will engage the whole time next year of the Secretary and such assistance as may be obtained. The photographing of meteorological phenomena continues in progress as opportunity offers, and at the next meeting of the Society the directors will be in a position to show to members a second series of these interesting and important photographs. This year the snow disappeared from the summit of Ben Nevis in the middle of May, being about a month earlier than any previous year, and seven weeks earlier than in 1885. Shortly thereafter, or in the beginning of June, the spring near the Observatory dried up; and during that month the water supply for the Observatory had to be carried on horseback, from a distance of two miles and a half. The directors have had under consideration a proposed systematic observation of the numbers of dust particles in the atmosphere with the instrument recently invented by Mr. Aitken, one of the directors, and they are of opinion that, for many reasons, the best place for most satisfactorily conducting the observations is the Ben Nevis Observatory. Mr. Aitken has kindly agreed to superintend the construction of the instrument, and to see to the placing of it in a suitable position. It has been resolved to apply for a grant from the Government Research Fund to aid in this novel and important inquiry. M. Mascart, Director of the Meteorological Service of France, has also resolved to carry on the same investigation in Paris.

IN a telegram from Yokohama, dated July 30, it is stated that the town of Kumamoto, on the Island of Kiou-Siou, near Nagasaki, had been visited by an earthquake, causing great loss of life and destruction of property.

SOME details with regard to the recent severe earthquake in Turkestan have been received at St. Petersburg. The first shock was felt at Vyernyi at 3.15 a.m. on July 12. Several houses were damaged and a great number of chimneys were destroyed. The same shock was felt at Jarkend, Pishpek, Ala-medyn, Prjevalsk (Kopal), Pavlodar, Lepsa, Semipalatinsk, Kulja, and on the Kashgar frontier. At Prjevalsk, all private houses on the shores of Lake Issyk-kul, as also the bridges, were destroyed; the shores bear many traces of landslips. The shock was so severe that people could hardly stand on their feet. At Pavlodar the direction of the earthquake was from south-west to north-east. At Semipalatinsk, the Irtysh was covered with heavy waves. The whole of the village Malovodnoie was destroyed, and in the canton of Koram seventeen men were killed. Several houses were destroyed in the villages of Zaitsevskoie, Mikhailovskoie, Lugovoie, Janghyz, and Karabulak, as also at Kulja. On July 14, three shocks were noticed at Jarkend, at 2, 4, and 10 p.m., and they were followed by several feebler shocks on July 15.

THE master of the *Argentina*, German mail steamer, which arrived at Lisbon from Pernambuco on July 19, reports that north of the Cape de Verd Islands heavy cross seas were experienced, in which the vessel pitched heavily. For four days the air was filled with reddish yellow dust, sometimes so thick that the sun could scarcely shine through it, and looked quite pale, although the sky was cloudless.

AMONG donations received at the meeting of the Royal Botanic Society on Saturday were seeds from the Parana River at Rosario, South America, collected by Mr. C. W. Sowerby. Mr. Sowerby announces his discovery of one of the habitats of *Pontedera azurea*, a very beautiful floating water-plant, which flowered some nine years ago in the Victoria House in the Society's Gardens, and has since been widely distributed. He states that masses of the plant were found floating down the river, and forming islands of one or two acres in extent, upon one of which a puma was seen.

AT the monthly meeting of the Royal Society of Queensland, on June 14, Mr. De Vis read a most interesting paper on *Prionodura newtoniana* (Meston's bower-bird) and *Acanthiza squamata*, recent additions to the Queensland avifauna. The former was minutely described. It was first found by Mr. K. Broadbent in the scrubs on the Tully River, but its true habitat is now ascertained to be the highlands north of Herberton, where it was observed by Mr. A. Meston in the course of a short visit to the top of Bellenden-Ker. Mr. Meston brought down the first skin of a male bird, but not in a condition to permit full recognition. Excellent specimens, male and female, were afterwards obtained by Mr. Broadbent near Herberton. Prionodura is emphatically a bower-bird. Both its observers in nature met with its bowers repeatedly, and agree in representing them as of unusual size and structure. The bower is usually built on the ground between two trees, or between a tree and a bush. It is constructed of small sticks and twigs, piled up almost horizontally round one of the trees, and rising to a height of from 4 to 6 feet. A similar pile about 18 inches high is then built round the foot of the other tree; the intervening space is arched over with stems of climbing plants; the piles are decorated with white moss, and the arch with moss interspersed with bunches of fruit resembling wild grapes. The birds, young and old, male and female, play merrily under and over the archway. The completion of the massive bower so laboriously attained is not sufficient to satisfy the architectural impulse of the bird, for scattered immediately around are numbers of dwarf hut-like structures—gunyahs they are called by Mr. Broadbent, who remarks that they give the spot exactly the appearance of a blacks' camp in miniature.

THE current number (vol. iii. No. 4) of the Journal of the Bombay Natural History Society contains a paper by Lieut. Barnes, on nesting in Western India, a district which, so far, appears to have been treated in an incomplete fashion in works on Indian oology. The writer seeks to collect, in as concise a form as possible, all information at present available on the subject, as a nucleus round which collectors may record their observations, and thus prepare the way for a complete knowledge of bird-life in Western India. Dr. Dymock writes on the means of self-protection possessed by certain plants, and Mr. Hart on certain branching palms, while Mr. Aitken discourses pleasantly on the natural history of a voyage from Liverpool to Bombay, and Mr. Oates has a short paper on the Indian and Burmese scorpions of the genus Isometrus, with a description of three new species. The Journal is almost always sure to contain one or two papers, half scientific, half sporting, from the pens of noted *shikarees*, which are sometimes of vivid interest. The present issue has a paper of this class on the habits of the sambhur, with personal reminiscences of sport in pursuit of it, by Mr. Reginald Gilbert, and a striking anonymous paper entitled "Mauled by a Panther." The illustrations, as usual, are numerous and of great beauty.

WITH regard to the question of the inheritance of injuries, a correspondent, "P. V.," writes to us about an Irish terrier bitch which had a litter by a mongrel terrier whose tail had been cut off with a hatchet. Of the litter, one dog puppy was without a tail. The Irish terrier belonged to "P. V.," and he says that she had had several litters before, none of which were in any way deformed.

PROF. FRANZ KLAPÁLEK, of Prague, has been investigating the rivers of Bohemia under the auspices of a committee formed for their physical exploration. In the course of his researches he was able to study the full life-history of *Agriotypus armatus*, Walker, a curious hymenopterous parasite on the aquatic larvæ of caddis-flies, chiefly of the genus *Silo*. The details are published in the *Entomologist's Monthly Magazine* for August, with illustrations. When these larvæ are attacked by the parasite, the cases have always a curious band-like appendage at one end. Formerly it was considered that this appendage was formed by the caddis-worm, but Prof. Klapálek proves that it is due to the larva of the parasite, and consists of the secretion from the salivary glands. What its precise use may be does not at present seem quite clear.

PROF. W. K. BURTON, of the College of Engineering, Imperial University, Tokio, writes to the *Japan Mail* that the Photographic Society of Japan has now been duly constituted, and that there are already nearly sixty members, of whom very nearly one-half are Japanese. There are a few professional photographers, but the great majority are amateurs. Viscount Enomoto, Minister of Education for Japan, has consented to be nominated as President. A meeting of the Society was held on June 7, when Mr. K. Ogawa gave a demonstration of the working of the platinotype printing process of Willis, from the coating of the paper to the completion of the print.

THE last monthly part of Mr. Samuel H. Scudder's "Butterflies of the Eastern United States and Canada, with especial reference to New England," will be issued on October 1. We have already called attention to the importance of this work. It makes three volumes, and contains seventeen plates of butterflies, six of eggs, eleven of caterpillars, two of the nests of caterpillars, three of chrysalids, two of parasites, thirty-three of structural details in all stages of life, nineteen maps and groups of maps to illustrate the geographical distribution of butterflies, and three portraits of early naturalists of America; in all about 2000 figures on ninety-six plates, of which forty-one are coloured. The text contains 2000 pages, including an introduction of 104 pages, and an appendix, of 150 pages, which contains descriptions of such species concerned as have not been found within the limits of New England, and also descriptions of all known parasites of North American butterflies, by Messrs. Howard and Williston.

THE City of London College Science Society has issued its Report for 1888–89. We are glad to see that the session was one of increased activity, and, as the Committee are able to add, of continued success. Papers on subjects of great scientific interest were read, and there were many excursions to places suitable for geological study and for the collection of botanical and zoological specimens. The Society now publishes a monthly journal.

MR. PERCY LINDLEY is editing a series of "Holiday Handbooks." One of those sent to us deals with the Hartz Mountains, another with the Ardennes. They cost only a penny each, and are well done. For the same price one may now get a very good little illustrated Guide to London. It is published by Mr. J. P. Murray.

THE tenth part of Cassell's "New Popular Educator" has been issued. It is well illustrated, and has a good map of British North America.

A REMARKABLE series of experiments illustrating an extreme case of "mass" or "catalytic" action are described by Messrs. Morse and White of the University of Pennsylvania, Philadelphia, in the current number of the *American Chemical Journal* (p. 348). The sulphides and oxides of zinc and cadmium, which are so difficultly volatilizable when heated alone, are found to be readily volatilizable in presence of their respective metals, zinc or cadmium, owing to alternate dissociation and recombination. The pure sulphides were first prepared by dissolving redistilled zinc or cadmium in hydrochloric acid and precipitating with sulphuretted hydrogen. The washed precipitates were next dried in the ordinary way, and then heated to 300° C. in a current of pure dry sulphuretted hydrogen. They were finally repeatedly treated with carbon bisulphide to remove any traces of free sulphur. The sulphides as thus prepared were found to be perfectly stable in a vacuum, the exhausted tubes containing them being heated until the glass softened and collapsed without any signs of volatility of the sulphides being apparent. About 15 grams of either of the sulphides were then mixed with 40 grams of the corresponding metal and placed at the sealed end of a combustion tube, the other end being connected with a Sprengel pump. The end containing the mixture was placed in a furnace, and after the exhaustion was completed as far as possible, was gradually heated. As the temperature rose the metal began to fuse, and a yellowish white film of sulphur was formed in the cool portion of the tube projecting out of the furnace. The formation of this deposit is due to the fact that while the tube is comparatively free from the metallic vapour, the sulphur liberated by the dissociation of the sulphide, having a higher rate of diffusion than the vapour of the metal, partly escapes recombination, and is deposited in the free state in the cooler portion of the tube just outside the furnace. As the temperature still rises this deposit becomes converted into sulphide, and eventually a long line of crystals of the sulphide is formed along the bottom of the projecting part of the tube. Cadmium sulphide was found to be transported much further along the tube than zinc sulphide, and the crystals could be seen to form and fall in a manner resembling a fine rain. Indeed, so ready is the dissociation of cadmium sulphide under the influence of metallic cadmium that by rapidly raising the temperature the experiment becomes dangerous, the dissociation occurring with almost explosive violence. On several occasions when the mixture was too tightly packed into the end of the tube, the whole contents were violently blown into the Sprengel pump. It is necessary to leave a very considerable free space along the top of the tube to insure a successful experiment. It was found that the oxides of zinc and cadmium behave similarly to the sulphides, oxide of zinc in this case dissociating most readily. The singular action of these metals in lessening the stability of their respective oxides and sulphides certainly forms one of the most extreme cases of "mass" or "catalytic" action on record; and that it is not a mere mechanical carrying action appears abundantly proved by the slight deposit of sulphur which is always noticed in the earlier stage of the experiment, and by the beautiful manner in which the sulphides themselves are afterwards deposited.

THE additions to the Zoological Society's Gardens during the past week include a Macaque Monkey (*Macacus cynomolgus* ♂) from India, presented by Mr. F. Dobbs; a Common Otter *Lutra vulgaris*) from North Wales, presented by Mr. Chas. H. Wynn; two White Storks (*Ciconia alba*) from North Africa, presented by Mr. Thomas Hay; three Well-marked Tortoises *Homopus signatus* ♂ ♀ ♀), four Rufescent Snakes (*Leptodira rufescens*), a Many-spotted Snake (*Psammophylax multimaculatus*), a Spotted Slowworm (*Acontias meleagris*), a Puff-Adder (*Vipera arietans*) from South Africa, presented by the Rev. G. H. R. Fisk; a Tesselated Snake (*Tropidonotus tessellatus*) from Italy, presented by Mr. H. D. Brocklehurst; two Common Toads (*Bufo vulgaris*), British, presented by Dr. J. J. Pitcairn; a Common Zebra (*Equus zebra* ♀) from South Africa, two Black-eared Marmosets (*Hapale penicillata*) from South-East Brazil, a Tovi Parrakeet (*Brotogerys tovi*) from Columbia, a Red and Blue Macaw (*Ara macao*) from Central America, deposited; a Peba Armadillo (*Tatasua peba*), a Pretre's Amazon (*Chrysotis pretrii*), a —— Snake (*Helicops leopardinus*) from Brazil, a White-throated Capuchin (*Cebus hypoleucus* ♂) from Central America, a Senegal Touracou (*Corythaix persa*) from West Africa, six Spotted Tinamous (*Nothura maculosa*) from Buenos Ayres, a Tesselated Snake (*Tropidonotus tessellatus*) from Italy, purchased; two Mule Deer (*Cariacus macrotis*), two Crested Pigeons (*Ocyphaps lophotes*), bred in the Gardens.

OUR ASTRONOMICAL COLUMN.

DISCOVERY OF A NEW COMET, 1889 *e*.—A telegram from Melbourne to Prof. Krueger announces the discovery of a bright comet by Mr. Davidson, of Queensland, on July 21. The following positions of this comet have been obtained:—

Place.		G.M.T.	R.A.	N.P.D.
		h. m. s.	h. m. s.	° ′ ″
Melbourne ...	July 22	23 3 50 ...	12 46 9·0 ...	122 29 6
Rome	July 27	8 37 4 ...	13 37 29·9 ...	110 19 2

The comet is therefore coming north very rapidly.

COMET 1889 *d* (BROOKS).—The following elements and ephemeris for this comet are by Dr. H. Oppenheim:—

$$T = 1889 \text{ August } 3{\cdot}40 \text{ G.M.T.}$$

$$\left.\begin{aligned} \pi &= 339^\circ\ 37' \\ \Omega &= 28\ \ 13 \\ \iota &= 5\ \ 56 \end{aligned}\right\} \text{Mean Eq. } 1889{\cdot}0.$$

$$q = 0{\cdot}3627$$

The comet probably has a short period.

Ephemeris for Greenwich Midnight.

1889.	R.A.		Decl.		Brightness.
	h. m.		° ′		
July 31 ...	0 4·2	...	7 3 S.	...	1·3
Aug. 4 ...	0 6·1	...	6 48		
8 ...	0 7·7	...	6 35 S.	...	1·4

The brightness at discovery is taken as unity.